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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/576,278

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Haruhiko Habuta

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EXAMINER

VERDERAME, ANNA L

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

07/23/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/576,278	Applicant(s) HABUTA ET AL.	
	Examiner ANNA L. VERDERAME	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-29 and 31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-29 and 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/01/2009 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 25-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In the last line of claim 25 and in claim 26 applicant recites M_k and M_{k-1} . It is unclear which layers are being referred to because earlier in claim 25 the metal content in the n-th layer is described as M_n and a k-th layer is never recited. The examiner believes that M_k is intended to refer to the compositional ratio of M in the n-th layer and M_{k-1} is intended to refer to the metal content in (n-1)-th layer. The examiner understands that the applicant intends for the claims to recite that the metal content in the N-th layer is at least 2 atom% greater than the metal content in the

Art Unit: 1795

(n-1)-th layer. The applicant should change " M_k " to " M_n " and " M_{k-1} " to " M_{n-1} ".

" $2 < k < n$ " should be deleted.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 25, 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Uno et al. WO 2004/027770(US 2005/0253210 used as an English language translation).

See medium number 2 in tables 1 and 2. Medium number 2 is a four layer optical recording medium having recording layers containing Te, O, and Pd. In medium number 2 the first recording layer/the layer nearest the light incidence plane has a compositional ratio of Pd which is 1% greater than that found in the second recording layer (see table 2). In this example the first recording layer corresponds to applicant's nth recording layer because it is the layer nearest the light incidence plane.

Disclosure is found on pages 20-25 of the WO document and in sections 0071-0076 of the US document.

With regard to claim 27 thicknesses of the recording layers in medium 2 are taught in table 1.

With regard to the limitation of claim 28, the examiner notes that both applicant and Uno et al. form the protective layers of 80:20 ZnS-SiO₂. Therefore, the protective layers in Uno et al. inherently exhibit a refractive index of at least 1.5.

With regard to the limitation of claim 29 it is the position of the examiner that the Al-Cr reflective layer used in media number 2 taught by Uno et al. will inherently possess a refractive index of no more than 2 and an extinction coefficient of at least 2 based on the disclosure to use similar materials for the reflective layer on page 10 of the applicant's specification.

With regard to the limitation recited in claim 25 which requires that the compositional ratio of M in the layer nearest the light incidence plane be at least 2% greater than that in the next closest layer to the light incidence plane, the examiner notes that it has been held that prior art which teaches a range overlapping or touching the claimed range anticipates the claimed range(emphasis added). Medium number 2 of Uno et al. discloses varying the metal content in the layer nearest the light incidence plane so that the layer contains 1% more metal than the next closest layer to the light incidence plane. 1% touches the claimed range of at least 2%.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1795

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 26 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uno et al. WO 2004/027770(US 2005/0253210 used as an English language translation) in view of Kitaura et al. US 2002/0022105 and Yasuda et al. US 6,221,455.

Uno et al. discloses a four layer optical recording layer having recording layers which contain Te, O, Pd wherein the metal concentration in the recording layer nearest the light incidence plane is 1% greater than that in the next closest layer to the light incidence plane. Uno et al. does not disclose the limitations of claims 26 or 31.

Kitaura et al. 2002/0022105 teaches a single layer optical recording media in figures 1-2 comprising a Te,O,M recording layer 3 and a dielectric layer 2. The dielectric layer can be placed on either side of the recording layer 3(0037). Figure 3 teaches a dual-layer optical recording layer comprising a first information layer 7, a separation layer 8, a second information layer 9 and a protective layer 4. Here at least the first information layer 7 or the second information layer 9 comprises a dielectric layer 2 and a recording layer 3(0038). Media having 2 to six layers can be formed(0027). A four layer medium is shown in figure 7(emphasis added).

The dielectric layer 2 is made of a material having a refractive index not less than 1.5. Examples of materials for the protective layer include ZnS, TiO₂, ZrO₂, Si, SiC, Si₃N₄, GeN or the like as the main component is suitable. Depending on the wavelength and the optical constant of each layer, it is preferable to determine the

Art Unit: 1795

thickness to be in the range between $0.31\lambda/n$ and $0.5\lambda/n$ where λ is a wavelength of an optical beam used for recording and reproduction is λ and a refractive index of the dielectric layer 2 is n (0040).

The wavelength used for recording is not more than 500 nm(0028). N is preferably 2.5 or more(0040). If a wavelength of 400 nm is used for recording and the refractive index of the protective layer is 2.5 then the minimum thickness for the recording layer $0.31\lambda/n$ is 48 nm and within the range taught in claim 6.

As the material for the recording layer a material containing Te, O, and M wherein M is one or more elements selected from Al, Si, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, Zr, Nb, Mo, Ru, Rh, Pd, Ag, In, Sn, Sb, Hf, Ta, W, Re, Os, Ir, Pt, Au, and Bi can be used. It is preferable that M is Pd or Au since a sufficient crystallization speed and high environmental stability can be obtained(0041). A preferable composition range for the recording layer 3 is from 25 to 60 atomic percent for O-atoms and from 1 to 35 atomic percent M-atom(0042). The recording layer has a thickness in the range of 5 nm to 70 nm(0029).

The reference discusses the results caused by adjusting the O-atom concentration and the M-atom concentration respectively (0043-0044). In an area where the O-atom in the recording layer is contained in an amount of 25 atomic percent or less a thermal conductivity of the layer is too high so that recording marks become too large. Thus even if the recording power is enhanced the C/N ratio does not rise. On the other hand in an area where the O-atom concentration in the recording layer exceeds 60 atomic percent, a thermal conductivity of the recording layer becomes too

Art Unit: 1795

low so that recording marks cannot be formed large enough even by enhancing the recording power. Thus the C/N ratio is low and the sensitivity also is insufficient(0043).

In an area where M-atom in the recording layer 3 is contained at less than 1 atomic percent the function of promoting crystal growth is low and the crystallization speed in the recording layer is insufficient so that marks can not be formed at a high recording speed. On the other hand in an area where the M-atom concentration exceeds 35 atomic percent a reflectance change between the amorphous and the crystalline phase deteriorates so that the C/N ratio is low(0044).

In regard to the limitation of instant claim 31 which requires annealing of the recording layer at a temperature of 60°C or higher for at least five minutes after the recording layer had been formed, this limitation is taught in Kitaura et al at (0013).

It would have been obvious to anneal the recording layers in medium number 2 taught by Uno et al. by heating the recording layers at a temperature of 60°C or higher for at least 5 minutes after the recording layers have been formed based on the example of Kitaura et al. and with a reasonable expectation of success based on the similarities between the media taught by Uno et al. and Kitaura et al.

Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify multi-layer information recording media number 2 taught by Uno et al. by adjusting the amount of metal added to each of the recording films within the acceptable range of 1 to 35 atomic percent M-atom recited in Kitaura et al. making sure that the amount of metal in the layer nearest the light incidence plane is greater

Art Unit: 1795

than that found in layers further from the light incidence plane based on the medium number 2 taught by Uno et al. where this is the case.

The experimental modification of this prior art in order to ascertain optimum operating conditions fails to render applicants' claims patentable in absence of unexpected results. In re Aller, 105 USPQ 233. One of ordinary skill in the art would have been motivated to adjust the amounts of metal in each of the recording films within the recited range of Kitaura et al. and the effects of such modifications would be predictable. Effects of adding metal to the Te-O film are taught in Kitaura and include changes in sensitivity and reflectivity of the film(0043-0044). . A prima facie case of obviousness may be rebutted, however, where the results of the optimizing variable which is known to be result-effective, are unexpectedly good In re Boesch and Slaney 205 USPQ 215.

Response to Arguments

Uno et al. teaches a medium wherein the recording layer nearest the light incidence plane has a higher metal content than recording layers further from the light incidence plane. This is the claimed inventive feature as stated in the applicant's remarks filed on 06/01/2009. Kitaura et al. discloses adjusting metal content in Te,O, Pd films and also discloses that the results of such adjustments are predictable. In order to show that the instant invention is non-obvious over the prior art applicant would need to show unexpected results when the metal content is varied by 2% or 4% as opposed to 1%.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA L. VERDERAME whose telephone number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark F. Huff/
Supervisory Patent Examiner, Art Unit 1795

/Anna L Verderame/
Examiner, Art Unit 1795